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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/961,134	09/21/2001	Stan Tsai	5262/CMP/CMP/RKK	4110
32588	7590	06/17/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			WONG, EDNA	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/961,134

Applicant(s)

TSAI ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

This is in response to the Second Response to the Final Office Action dated May 19, 2004. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The finality of the rejection of the last Office action has been withdrawn in view of the newly discovered reference(s) to **Collins** (US Patent No. 6,723,219 B2). Rejections based on the newly cited reference(s) follow.

Response to Arguments

Claim Rejections - 35 USC § 103

Claim **24** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Ashjaee et al.** (US Patent Application Publication No. 2003/0029731 A1).

The rejection of claim 24 under 35 U.S.C. 103(a) as being unpatentable over Ashjaee et al. has been withdrawn in view of Applicants' remarks.

Response to Amendment

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim **24** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Talieh et al.** (US Patent No. 6,497,800 B1) in combination with **Collins** (US Patent No. 6,723,219 B2).

Talieh teaches a method of forming a metal layer on comprising:

(a) positioning a substrate **16** in an electroplating cell **9c** having a porous pad **8** and an electrolyte solution **9a** therein (col. 3, line 53 to col. 4, line 40; and Fig. 2);

(b) contacting at least a portion of the substrate to the porous pad (col. 4, lines 36-40); and

(c) forming a metal layer on the substrate by biasing the substrate relative to an electrode at a first electrical bias and then biasing the substrate relative to the electrode at a second electrical bias, wherein the first electrical bias deposits metal on the substrate and the second electrical bias removes metal from the substrate (col. 6, lines 42-51).

Talieh does not teach (d) varying the magnitude of the second electrical bias relative to the first electrical bias as the metal layer is formed.

However, Collins teaches a method of forming a metal layer comprising the step of applying a pulse periodic reverse potential wherein the magnitude of the second electrical bias relative to the first electrical bias is varied as the metal layer is formed (col. 3, line 45 to col. 4, line 37; and Fig. 4). This facilitates the filling of structures in the center of a low conductivity layer without overdepositing on the outside edge, thus

ensuring a controlled deposition of material across the surface of the low conductivity layer (col. 3, lines 6-16; col. 5, lines 49-56; and col. 7, lines 51-60).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Talieh by varying the magnitude of the second electrical bias relative to the first electrical bias as the metal layer is formed because Talieh teaches that the polarity of the voltage applied between the anode and cathode plates is reversed and that the circuitry used for application and adjustment of the voltage, and for inversion of the voltage polarity, is well known and commonly used (col. 6, lines 42-51).

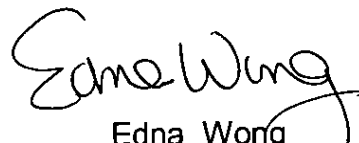
A well known and commonly used application and adjustment of the voltage would have been the pulse periodic reverse potential as taught by Collins. Applying a pulse periodic reverse potential wherein the magnitude of the second electrical bias relative to the first electrical bias is varied as the metal layer is formed would have provided for the uniform filling of high aspect ratios and for the controlled deposition of a layer of desired structure and thickness across the entire surface of a metal layer as taught by Collins (col. 2, lines 7-11; col. 3, lines 6-16; col. 3, line 45 to col. 4, line 37; col. 5, lines 49-56; and col. 7, lines 51-60; and Fig. 4).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-

1349. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt.
Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Edna Wong
Primary Examiner
Art Unit 1753

EW
June 5, 2004